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CLINICAL MARKERS OF GASTROENTEROLOGICAL DISORDERS IN NEWBORNS WHO HAVE UNDERGONE PERINATAL PATHOLOGY

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According to scientific publications, the prevalence of digestive pathology occupies one of the leading places in the structure of morbidity among children, in particular, functional disorders of the gastrointestinal tract (GIT) occupy from 60% to 95% in the overall structure of gastrointestinal pathology. Premature babies have an immature gastrointestinal tract, a lower ability to digest nutrients than full-term babies, which can impair their absorption and is a major problem in their care.

The study aim is to investigate clinical markers of gastrointestinal disorders in newborns who have undergone perinatal pathology. An examination of 148 premature infants was conducted. The first group consisted of 91 children, 29-36 weeks of gestation, who had a difficult condition after birth, the second group included 57 relatively healthy children, 35-36 weeks of gestation.

Based on the results of somatic health and obstetric and gynecological history depicted mothers having a set of risk factors, the implementation of which led to the birth of children with perinatal pathology, namely: combined somatic and gynecological pathology of the mothers, burdensome obstetric history, complications of pregnancy and childbirth. Disorders of adaptation in the neonatal period were caused by manifestations of respiratory distress syndrome in 91 cases (100.0%), asphyxia in 25 children (27.47%), neonatal encephalopathy in 65 children (71.43%), prematurity in 91 cases (100.0%), multiple organ failure in 42 cases (46.15%), anemic-hemorrhagic syndrome in 23 cases (25.27%). In the neonatal period there were clinical symptoms of perinatal pathology, which was accompanied by a syndrome of vegetative-visceral dysfunction, that in turn, included disorders of the gastrointestinal tract, in particular 44 newborns of group I (48.35%) showed a significant decrease in sucking reflex, 47 cases (51.65%) showed lack of sucking reflex, decreased food tolerance was evident in 83 cases (91.12%), vomiting in 70 newborns (46.92%), intestinal paresis in 48 cases (52.75%), delayed meconium excretion in 20 newborns (21.98%), flatulence in 43 babies (47.25%). 41 cases (45.05%) were diagnosed with functional disorders of the gastrointestinal tract in premature infants with severe perinatal pathology as one of the manifestations. In addition to conventional methods, the newborns underwent additional coprofiltrate testing to determine markers of inflammation: albumin level, alpha-1-antitrypsin level, secretory immunoglobulin A level, fecal elastase-1 level, PMN-elastase level, calprotectin level, content of fat, starch and food remnants as well as indicators of the biochemical spectrum of blood which characterize the functional state of pancreas: the activity of amylase, lipase, trypsin, leucine aminopeptidase in serum; determination of amylase levels in urine.

Adverse factors of the perinatal period can lead to the development of hypoxia, impaired adaptation of the newborn and provoke, in particular, the development of gastrointestinal pathology. In newborns who have undergone perinatal pathology, clinical markers of dysfunction of the gastrointestinal tract have been identified, which, in turn, requires the development of directions for prognosis, diagnosis, prevention and correction to notify the development of chronic gastrointestinal pathology.

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THE ROLE OF URINARY β2-MICROGLOBULIN IN PREDICTING TUBULAR DAMAGE IN PREMATURE INFANTS OF DIFFERENT GESTATIONAL AGES

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Premature newborns (PN) are at higher risk of development severe renal damage, especially acute kidney injury (AKI). This syndrome is independently associated with pathological consequences and increased mortality (McCaffrey, 2015). The incidence of AKI is higher in PN with very low birth weight (WLBV) and extremely low birth weight (ELBW). It is also varied by

gestational age (GA), occurring in 48% of patients born at 22-29 weeks, 18% of patients born at 29-36 weeks (Jetton et al., 2015). ELBW PN also showed different aspects of glomerular or\and renal dysfunction. Many modern studies show that there are perspective biomarkers for identification of early stages of renal impairment, for example, cystatin-C (urinary and plasma measurement), kidney injury molecule-1 (KIM), urinary α1-microglobulin (Uα1-MG), urinary β2-microglobulin (Uβ2-MG), urinary albumin (UAlb) (Askenazi et al., 2016).

Objectives: the aim of our study was to identify the role of Uβ2-MG in prediction of tubular dysfunction/injury in PN with different GA (24 - 36 weeks). Our study included 68 PN admitted to the NICU at the Clinical Maternity Hospital 2 (Chernivtsi, Ukraine) in 2018-2020. The inclusion criteria were as follows: the GA is more than 24 weeks and less than 37 weeks; birth body weight (BBW) is more than 500 g and less than 2500 g; presence of clinical signs of severe perinatal pathology. The inclusion criteria were as follows: the GA is less than 24 weeks and more than 37 weeks; BBW is less than 500 g and more than 2500 g; preterm neonates with any congenital abnormalities of the kidneys and urinary tract; early neonatal sepsis. The evaluation of severity of perinatal pathology was performed by using neonatal Therapeutic Intervention Scoring System (nTISS) (Richardson et al., 1993). All patients had a nTISS score at least 10 points or more and demonstrated moderate or severe heterogenic perinatal pathology with multiple clinical signs. The patients were divided into three groups: the Group I was - 25 PN at the GA of 24-31 weeks, the Group II – 25 PN at the GA 32-33 weeks, the Group III – 18 PN at the GA of 34-36 weeks. Uβ2-MG was measured using the competitive immuno-luminescence assay. Statistical analyses were performed using the statistical software Statistica.

Uβ2-MG is a protein with low molecular weight, normally excreted by all nuclear cells and filtered at the glomerulus. Total reabsorption by proximal tubular cells is the last phase of Uβ2-MG metabolism. The elevation of levels Uβ2-MG is an early marker of tubular dysfunction, especially in case of ischemic or reperfusion renal damage. The main researchers (Askenazi et al.,2011; Jetton et al., 2015) described that Uβ2-MG decreased with increasing GA. In our study we established opposite result with increasing levels of Uβ2-MG in PN with lower GA (Group I - 4.89 [2.86; 6.99] mg/l, Group II - 3.4 [2.9; 3.8] mg/l; Group III - 6.15 [4.11; 6.85] mg/l; Kruskal-Wallis test, p-value = 0.0014).

Our results demonstrated that PN with severe heterogenic perinatal pathology has different aspects of tubular dysfunction. According to changes in urinary levels, analysis demonstrated direct correlations between GA and Uβ2-MG ($p<0.05$), however, longer longitudinal cohort studies on PN are required to establish the predictive and diagnostic role of Uβ2-MG in these patients.

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PECULIARITIES OF THE BIOCHEMICAL SPECTRUM OF BLOOD IN PREMATURE NEWBORN IN CONDITIONS OF PERINATAL PATHOLOGY

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Antenatal hypoxia has a significant and often irreversible effect on various aspects of fetal life and adaptation of the newborn, especially in cases of premature birth. Although, according to some authors, moderate intrauterine hypoxia contributes to a certain degree of adaptation of the newborn, our observations of newborns during the implementation of perinatal risk factors are a prerequisite for the deterioration of the child's ability to adapt to environmental conditions. The combined effect of adverse factors is the cause of severe forms of maladaptation, accompanied by significant metabolic disorders.

The purpose and objectives of the study: to determine the features of the biochemical spectrum of blood in premature infants depending on the severity of the condition in the early neonatal period.

A comprehensive clinical and paraclinical examination of 102 newborns from gestational age from 30 to 37 weeks who had impaired adaptation or nosological forms of pathology in the first week of life. The first group consisted of 25 children who had clinically moderate maladaptation